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## Automatic Transfer Switch

### User Manual

ATS-16A/20A/30A/32A



## 1. Important Safety Instructions

This document provides important instructions for a safe installation, operation and use of the ATS.

1. Do not disassemble the ATS as there are no serviceable parts inside. Disassembling can cause electric shock and warranty will be void.
2. All repairs and maintenance should only be done by a qualified technician or authorized distributor.
3. This ATS supports electronic equipment in office, telecommunication, process control, medical and security applications. Non-authorized technicians are not allowed to install the ATS in the following areas:
  - a. Life supporting medical equipment.
  - b. Elevators, subway systems or any other equipment related to human safety.
  - c. Public systems critical computer systems.
4. Please discuss with your distributor before installing the product at the locations mentioned above. Special considerations and designs are required for the operation, setup, management, and maintenance of critical equipment and emergency backup power generators related to personal safety and public facilities.
5. This equipment is not water proof.
6. Do not install the ATS in an environment with sparks, smoke, or gas.
7. This ATS is designed to be installed in a sheltered, controlled environment as follow:
  - Operating temperature 0-40°C, and 30-90% non-condensing humidity;
  - Avoid locations with dust, corrosive material, salt content, or flammable gas;
  - Install the ATS indoors as it is not designed for outdoor installation.
8. Improper grounding results in electrical leakage. Please ensure your AC input power is properly grounded.
9. Ensure the input voltage of the ATS matches the utility supply voltage. Use a certified input power cable with the correct plugs and sockets for the appropriate voltage system.

## 2. Overview

The ATS (Automatic Transfer Switch) features two independent power supply source supplying power to the load (as shown in Figure 1 below). In the event of a power failure in the main utility (Source A), the ATS automatically switches to Source B to supply power to the load. The ATS automatically switches back to Source A after power is restored. In addition, the ATS provides user configurable power status (voltage or frequency) for the ATS switching condition.

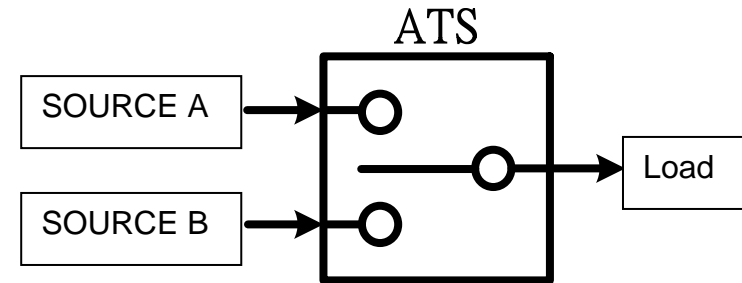
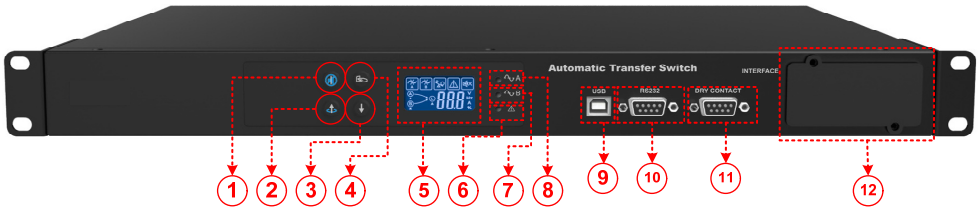


Figure 1. ATS block diagram

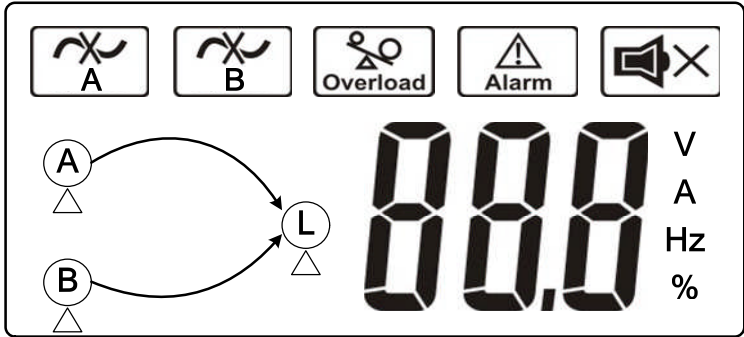
3. Product Functional Description

3.1. Front Panel



No.	Item	Description/function
1	Mute button	Turn off the sound of the alarm
2	Source selection button	Select source to view info: Input A, Input B, or Load
3	Info selection button	Select source info to view: Voltage, current, frequency, load capacity
4	Input selection button	Switch input source: Input A ⇄ Input B
5	LCD	System status display
6	Input indicator A	Lit: Normal input voltage and frequency Dim: Abnormal input voltage and frequency Flashing: Indicates higher priority
7	Input indicator B	Lit: Normal input voltage and frequency Dim: Abnormal input voltage and frequency Flashing: Indicates higher priority
8	Error indicator	Lit: System malfunction or abnormal Dim: System normal
9	USB port	Connection for software setup or monitoring software
10	RS-232 port	Connection for software setup or monitoring software
11	Dry contact port	Dry Contact
12	External communication slot	For external communication cards, e.g. RS-485, SNMP

3.2. LCD Display Description

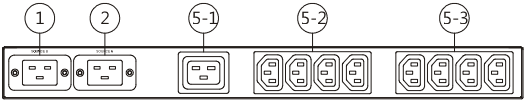


Symbol	Description/function	
	Input A error or power failure	
	Input B error or power failure	
	Overload	
	System malfunction or abnormal	
		Alarm on
		Alarm off
	Digital display showing input/output power connected to load	
	ATS numeric display	

3.3. Rear Panel

Following is a rear view and basic information for each available ATS model.

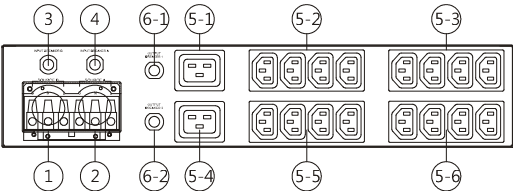
ATS-216 (230V-16A)



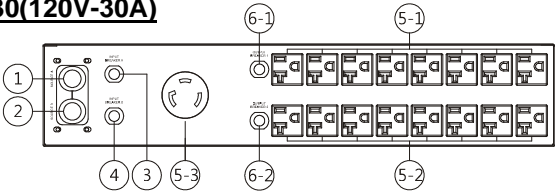
ATS-120 (120V-20A)



ATS- 232 (230V-30A)



ATS- 130(120V-30A)

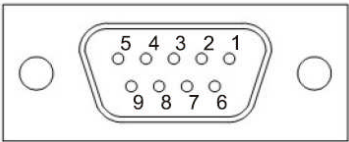


- 1 Power input (B)
- 2 Power input (A)
- 3 , 4 Input breaker (optional, sold separately)
- 5 Output socket
- 6 Output breaker

3.4. Communication Interface

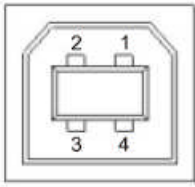
The ATS provides three communication ports and one external communication slot (optional) for the user.  
Standard communication ports: RS-232, USB, and 5 dry contacts  
External communication slot: SNMP, RS-485

3.4.1. RS-232



Pin	Definition	Type	Signal
1	N/A	N/A	N/A
2	TX	Output	TX
3	RX	Input	RX
4	N/A	N/A	N/A
5	GND	Power source	N/A
6	+12V	Power source	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A

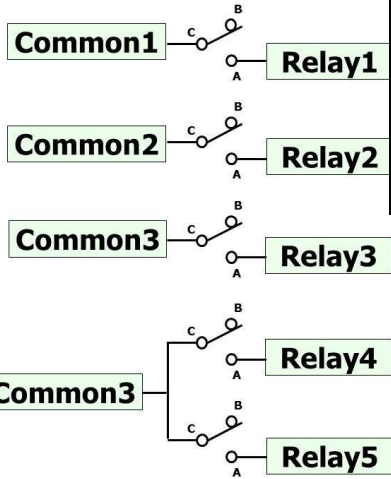
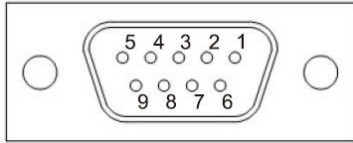
3.4.2. USB



Pin	Signal
1	VBUS
2	D-
3	D+
4	GND

### 3.4.3. Dry Contact

The ATS provides five user configurable dry contacts for customized features (Refer to Appendix 1). The capacity of each contact is 24Vdc/1A.



Pin	Definition	Signal (default)
1	Common 3	N/A
2	Relay 3	<b>System Alarm</b>
3	Relay 4	<b>Overload</b>
4	Common	N/A
5	Relay 5	<b>Over temperature</b>
6	Common 1	N/A
7	Relay 1	<b>Source A abnormal</b>
8	Common 2	N/A
9	Relay 2	<b>Source B abnormal</b>

## 4. Installation and Operating Instructions

### 4.1. Unpacking

Upon receiving of goods, inspect the package and contents for shipping damage. Any missing contents, damage or other problem must be reported to the forwarder or dealer as soon as possible.

Product Inventory:

- ATS Module
- RS-232 cable x1 pcs
- USB cable x1 pcs
- CD (Monitoring software and Setting tool) x1 pcs
- User Manual x1 pcs
- Backplate and screws x1 set
- \*Power cable x2 pcs

\*Available for ATS-216 models only.

## 4.2. Installation Procedures

1. Affix the two included backplates to the ATS as shown in Figure 1.
2. Mount the ATS into a 19" rack or into a cabinet with 19" inner design as shown on Figure 2.
3. Connect the load power cords to the ATS sockets labelled "OUTPUT"
4. Check that the total load does not exceed ATS specifications (e.g. voltage, current).
5. Turn on all connected equipment. The ATS automatically boots up after 1 second and supply power to the connected load.

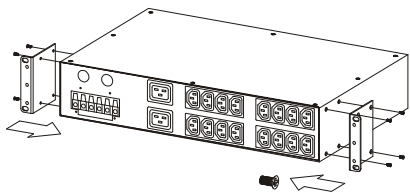


Figure 1

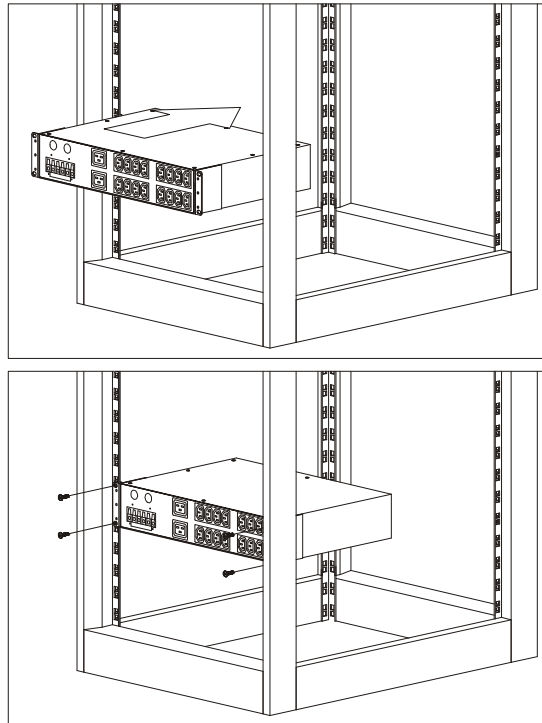


Figure 2

## 4.3. Operating Procedures

### 4.3.1. Boot Up

Once the input power is connected, the ATS automatically boots up and the LCD display and LEDs (⚡ A, ⚡ B, ⚠) are lit as shown in Figure 3. After boot up, the LCD display the input source voltage as shown in Figure 4 and the selected Input indicator A (⚡ A) LED or Input indicator B (⚡ B) LED is lit.

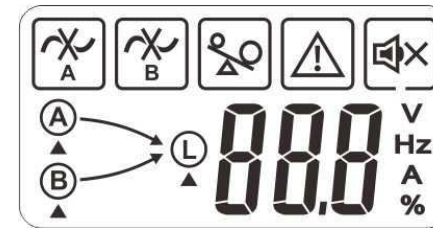


Figure 3

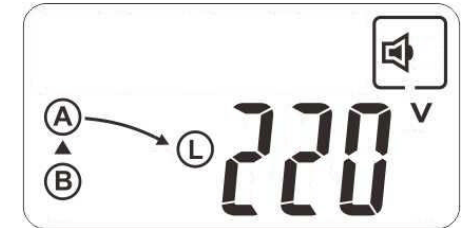


Figure 4

### 4.3.2. Switch input source

The ATS supports manual switching between power supplies as instructed below:

Press and hold the Input selection button (⏏) for 2 seconds until you hear two short beeps. The system display the power transfer (LCD display as shown in Figure 5), press again and hold the Input selection button (⏏) for 2 seconds to confirm. The system will switch to Source B (LCD display as shown in Figure 6) if the power supply is present. If the power supply is not present and switching fails, the LCD display a warning **no** as shown in Figure 7.

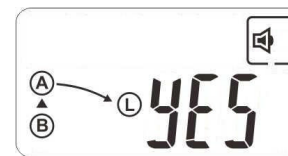


Figure 5

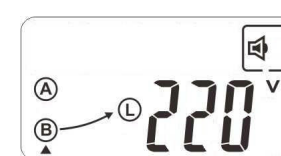


Figure 6

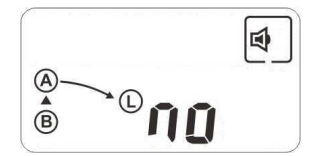


Figure 7

## 5. Troubleshooting

If you encounter problems with the ATS, refer to the troubleshooting guide below. Should the problem persist, please contact your local dealer for assistance.

Issue	Possible Cause	Solution
ATS is OFF	Not connected to the electrical grid	Check the connection from the electrical grid to the ATS input
	Abnormal electrical grid	Request service by professional electrician
	Input breaker has been tripped	Reset breaker
	Internal components have been damaged	Please contact the local dealer.
Power is supplied to the load but panel remains off	Internal components have been damaged	Please contact the local dealer
Error code Er01, Er02	Not connected to the electrical grid	Check the connection from the electrical grid to the ATS input
	Abnormal electrical grid	Request service by professional electrician
Error code Er03 to Er15	Abnormal power system	Request service by professional electrician
Error code Er16	Overload	Check the load capacity
Error code Er17 to Er32	Abnormal internal components	Please contact the local dealer

## 6. System Specifications

Model	ATS-120	ATS-130
Input		
Input voltage	100V / 110V / 115V / 120V / 127V (software selectable: +/-5%, 10%, 15%, 20%)	
Input voltage range	75Vac~150Vac	
Input frequency	50/60Hz (software selectable: +/- 5%, 10%, 15%, 20%)	
Input current	20A	30A
Output		
Output voltage	100V / 110V / 115V / 120V / 127V	
Output current	20A	30A
Connection		
Input	NEMA 5-20 x 2	NEMA L5-30 x 2
Output	NEMA 5-20 x 8	NEMA 5-20 x 16, NEMA L5-30 x 1
Protection	Input Breaker(option)	
	Electronic circuit	
Communication	RS-232, USB, Dry contact external slot for option card (SNMP, RS-485)	
Transfer time(ms)	6ms typical, 16ms maximum	
Efficiency	99% (with full linear load)	
Display	LCD+LED	
Physical		
Dimension, D X W X H (mm)	275 x 440 x 44	275 x 440 x 88
Net Weight (kgs)	4	6
Environment		
Operating temperature	-5~40° C @ 20~90% RH (non-condensing)	
Standards compliance	Safety	UL 60950-1/CAN/CSA C22.2 No. 60950-1
	EMC	FCC Part 15

Model	ATS-216		ATS-232	
Input				
Input voltage		200V / 208V / 220V / 230V / 240V (software selectable: +/- 5%, 10%, 15%, 20%)		
Input voltage range		150Vac~300Vac		
Input frequency		50/60Hz (software selectable: +/- 5%, 10%, 15%, 20%)		
Input current		16A	32A	
Output				
Output voltage		200V / 208V / 220V / 230V / 240V		
Output current		16A	32A	
Connection				
Input		IEC-C20 inlets x2	40A terminal 6P	
output		IEC-C13 x 8, IEC-C19 x 1	IEC-C13 x16, IEC-C19 x2	
Protection		Input Breaker (option)		
		Electronic circuit		
Communication		RS-232, USB, Dry contact external slot for option card (SNMP, RS-485)		
Transfer time(ms)		6ms typical, 16ms maximum		
Efficiency		99% (with full linear load)		
Display		LCD+LED		
Physical				
Dimension, D X W X H (mm)		275 x 440 x 44	275 x 440 x 88	
Net Weight (kgs)		4	6	
Environment				
Operating temperature		-5~40° C @ 20~90% RH (non-condensing)		
Standards compliance	Safety	UL 60950-1/ CAN/CSA C22.2 No. 60950-1 , IEC 60950-1		
	EMC	FCC Part 15 , EN62310-2		

## 7. Appendix A. Customized features to configure dry contacts

	Event	Code
1	Source A no power	Er01
2	Source B no power	Er02
3	Source A voltage abnormal	Er03
4	Source B voltage abnormal	Er04
5	Source A frequency abnormal	Er05
6	Source B frequency abnormal	Er06
7	Source A voltage and frequency abnormal	Er07
8	Source B voltage and frequency abnormal	Er08
9	ATS no output due to source A and B abnormal	Er09
10	Source A voltage unbalance	Er10
11	Source B voltage unbalance	Er11
12	ATS output voltage unbalance	Er12
13	ATS output voltage abnormal	Er13
14	ATS output frequency abnormal	Er14
15	ATS output voltage and frequency abnormal	Er15
16	ATS output overload and cut output	Er16
17	ATS output short circuit and cut output	Er17
18	Input relay defect on source A	Er18
19	Input relay defect on source B	Er19
20	Source transfer relay defect	Er20
21	ATS output relay defect	Er21
22	Internal working power 12V defect on source A	Er22
23	Internal working power 12V defect on source B	Er23
24	System over temperature	Er24
25	System DC offset error	Er25
26	EEPROM working abnormal	Er26
27	Emergency Power Off	Er27
28	Loss LCD connection	Er28
29	Internal transferring inhibition by some reason	Er29
30	Overload transferring is over 4 times and system lock	Er30
31	Inhibit to transferring due to phase angle over shift	Er31
32	System Alarm	Er32







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